



Supercritical fluid phase synthesis of methylene lactones using oxynitride catalyst

Description of Technology: The invention pertains to a method of producing unsubstituted and substituted alpha-methylene lactones from reaction of lactones with formaldehyde in a supercritical or near-critical fluid phase in the presence of an oxynitride catalyst or oxynitride catalyst composite.

Patent Listing:

1. **US Patent No. 7,153,981**, Issued December 26, 2006, "Supercritical fluid phase synthesis of methylene lactones using oxynitride catalyst"

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Market Potential: Alpha-methylene-gamma-butyrolactone and methyl alpha-methylene-gamma-butyrolactone are useful monomers in the preparation of both homopolymers and copolymers. In addition, the alpha-methylene-gamma-butyrolactone group is an important structural feature of many sesquiterpenes of biological importance.

Although phosphorus oxynitride materials might be expected to possess a significant advantage in hydrothermal stability compared to conventional silica catalysts, the catalytic activity of such materials for lactone conversion reactions cannot be predicted because of the unpredictable nature of catalysis in general.

It would be advantageous to have a catalyst that is hydrothermally stable at high temperatures and whose activity does not decay with time on stream (TOS) or after several high temperature oxidizing regenerations.

Benefits:

- Utilizes a catalyst that is hydrothermally stable
- Activity does not decay with time on stream

Applications:

- Production of lactones

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